SRAP
Smallholder Rubber Agroforestry Project
ICRAF/GAPKINDO/SRAP

WEST-SUMATRA

PROGRESS REPORT

NUMBER 3/december 1996

R.A.S ON FARM EXPERIMENTATION
IMPLEMENTATION IN THE WEST-SUMATRA PROVINCE
In East Pasaman

MONITORING MISSION DECEMBER 1996

Eric Penot, ICRAF/CIRAD-CP
Pak Hisar, BPS/IRRI

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1 OBJECTIVE OF THE MISSION

The main objective was to monitor the implementation of the 8 on-farm trials in the village of Bangkok, East Pasaman. A programme of activities has been set up with the staff involved in the activities, ie Pak Coan, PPL from DISBUN, who will work 2 days a week on SRAP activities, Pak Sofyan, Pro-RLK, as field coordinator, Pak Hisar, BPS for technical support and Hellen Kramer, Pro-Rlk, as supervisor.

2 TRIALS CHARACTERISTICS

All 8 trials are located in the village of Bangkok, representative of a very critical land pattern with the following characteristics :

- The altitude is at the limit of marginal land for rubber (between 500 and 600 meters).
- soils are acid leached soils with a very low nutrients content,
- steep slopes with high risk of erosion,
- sheet Imperata environment.

RAS 2.2 systems with continuous foodcrops pattern and countour lines appear as one of the most probable tree crop based alternative to rehabilitate such critical land.

The 3 trials implemented in Bangkok are the following :

RAS 2.2a : *comparison of 3 amounts of fertilization for rubber* :

- PLOT A : "0 fertilization",

- PLOT B : " application of high amount of Rock Phosphate (RP) at planting time only (1 ton /ha or RP, 27.5 % in the planting hole and 72.5 % broadcast in the field at planting time)

So - in theplanting hole : 500 grams per trees (275 kg/ha)
- broadcast in the field at planting time : 725 kg/ha

- PLOT C : complete TCSDP fertilization programme for the first 2 years with RP at planting time and NPK fertilisation every 3 months).

TCSDP fertilization programme is the following:

IN GRAMMES/tree

	PLANTING TIME October 96	+ 3 months January 97	+ 6 months April	+ 9 months July	+ 12 months October
RP	200				
UREA		50	50	50	50
SP36		40	40	40	40
KCL			40	40	40

The amount of each fertilizer to be supplied to the plots is calculated in anex for each farmer and for each plot.

Note that the protocol of this trial has been changed compared to the original version released in the March 1996 report, to take into account the interesting results of the PKT demo plots (use of 1 ton of RP/ha).

RAS 2.2b : *emphasis is put on rice experimentation : varieties x fertilization.*

- PLOT A : local rice or improved rice (variety 1) + 0 fertilization

- PLOT B : local rice or improved rice (variety 1) + CRIFC fertilization dose (high dose recommended by CRIFC/Bogor)

- PLOT C : improved rice (variety 2 + 0 fertilization

- PLOT D : improved rice (variety 2) + CRIFC fertilization dose (high dose recommended by CRIFC/Bogor)

Rice varieties 1 and 2 are Wayararem and Jatiluhur with a 4 months cycle.
Local rice varieties have a 6 month cycle.

"CRIFC fertilization dose" is the dose recommended by CRIFC/Bogor for JAMBI.

FERTILIZATION DOSE

DOSE IN KG/HA	UREA	SP 36	KCL
CRIFC	150	220	150

Note that the protocol of this trial has been changed compared to the original version released in the March 1996 report.

In 1996, due to the fact that some farmers have already planted their fields with local rice, the programme is the following :

farmers	PLOT A	PLOT B	PLOT C	PLOT D
SIAM	LOCAL RICE			
BURHAM	LOCAL RICE			
BADUL	Jatiluhur	Jatiluhur	Wayararem	Wayararem
MUKTAR	local No fertilization	local no fertilization	Wayararem	Wayararem
BURHAM extra plot	Jatiluhur	Jatiluhur		

Siam and Burham : no rice experiment in 1996. Loca rice with no fertilization.
Badul : complete design with 4 plots : Jatiluhur/Wayararem x dose 0/dose CRIFC
Muktar : design of the fields according to the map as some plot have been partially planted with local rice (no fertilization) and 2 plots will be planted with Wayararem (1 plot with 0 fertilization and 1 plot with CRIFC fertilization).

To complete the rice experiment, a small plot without rubber (pak Burham) will be planted with 2 plots : be planted with Jatiluhur (1 plot with 0 fertilization and 1 plot with CRIFC fertilization).

RAS 2.2c : ***emphasis is put on the comparison between clones (both RRIC 100 and PB 260), BLIG (BLIG from North-Sumatra, and Seedlings from South-Sumatra (originally sold as BLIG but supplied to DRAP by a South Sumatra project).***

The 3 plots are :
- PLOT A : clone
- PLOT B : BLIG
- PLOT C : Seedlings from South Sumatra.

The relative hologeneity and absence of characteristic yellow leaves plants of BLIG in the planting material supplied by a project in South-Sumatra indicates the possibility that this planting material is not BLIG but another clonal seedling planting material.

Normaly, these plots are planted with improved rice varieties with BPS fertilization (BPS is a moderate dose of fertilization).
' BPS fertilization dose" is the dose recommended by BPS/Sembawa (used in RAS 2.2c)

FERTILIZATION DOSE for RAS 2/2c

DOSE IN KG/HA	UREA	SP 36	KCL
BPS	100	160	75

In 1996; farmers have planted their fields with local rice so this protocol for rice is cancelled and postmoned for 1997..

In 1996 : local rice and NO fertilization

All new RAS trials protocols are presented in anex 1.
Plot situation is presented in anex 2.

3 VISIT TO THE SRAP SITE IN EAST PASAMAN : in the village of BANGKOK.

The mortality of rubber has been very high (up to 80 %in the RAS 2.2a fields) due to late planting, direct planting of stumps and relative drought of the dry season. The late and direct planting has not allow the rubber trees to have a sufficient development of roots to compete with drought.
Therefore, the conclusion for rubber are the following according to this very critical environment :

- early planting in october of stumps in polybags with the minimum stage of 1 whorl is required . Stumps have therefore to be prepared in polybags in July for a planting in the fields in october. The sooner the best in order to allow a sufficient development of the young trees to survive a possible drought in dry season, according to erractic rainfall pattern.

- fertilization seems to be a key component for the first year, either with a high amount of RP at planting time of with a 3 months continuous supply such as TCSDP fertilization programme. The trial RAS 2.2a should provide an answer.

- Imperata is not anymore a problem as long as continuous cropping is done by the farmer : the consequence is that weeding of rubber trees is perfect. However, continuous cropping without supply of fertilizers may lead probably to a limited nutrient supply for

rubber. fertilization of intercrops shouls be seriously considered.

- rotation of rice and leguminous(peanut in that case) is favorable to both rubber growth and rice production

A summary of each plot situation is presented in annex 1 (Pak Hisar's Progress report of November 1996

4 MAIN COMPONENT OF A PROGRAMME OF ACTIVITIES

4.1PROGRAMME OF ACTIVITIES FOR THE PPL/DISBUN

Time table : 2 days per week.

Programme of activities per month

AUGUSTUS

Maps of each fields will be provided to the PPL by ICRAF. Fields maps have the complete design of the fields with all rubber and associated trees.
These fields maps are the following :
- fields maps with locations for associated trees (Durian, Petai, Jengkol, Kemiri and Cinnamon)
- fields maps with the definition of the plots according to the type of trials :
    - RAS 2.2a/rubber fertilization : 3 plots with fertilization dose : 0, RP at planting time and TCSDP (RP at planting time and SP36/UREA/KCL every 3 months)
    - RAS 2.2b /Rice fertilization : 4 plots : 2 varieties x 2 dose of fertilization (0 and CRIFC).
    - RAS 2.2c/ Comparison clone/BLIG : 3 plots with clone, BLIG and seedlings from SumSel.
- fields maps with the selection of rubber trees to be measured for growth monitoring in each plots.

PPL and other staff should use these fields maps in order to implement the fields and monitor the farmers activities on rice and rubber planting, planting of associated trees and rice and rubber fertilization.

ACTIVITIES

- field stacking (pancan ajir) for clonal rubber for the 2 following farmers : Pak Badul and Pak Moktar (plots where rubber has to be planted in October 96).
- field stacking for non clonal rubber for the 2 following farmers for the "Bidji Sumsel" plots : Pak Budiman and Pak Udin (plots to be planted in October 96).
- field stacking for rice experiment : pak Burham (extra field close to the ICRAF field), pak Badul, pak Muktar.

The field stacking is according to fields maps provided to PPL.

- monitoring of the dead plants in each field : an empty map is copied and each dead tree should be marked as "dead". For all 6 planted fields. A table may report the total number of trees, the dead trees and the trees alive such as following :

Name of the farmer :
Type of trial:
Plot name :

PLOTS	total number of trees	DEAD TREES	TREES ALIVE
A			
B			
etc.....			

- ordering of fertilizers and other inputs necessary for the campaign (sprayer, round-up....), according to the field mission progress report of August 1996.

SEPTEMBER

- field staking for associated trees, according to the map provided by ICRAF. All 8 fields. All tree locations will be labeled with the name of the tree to be planted, so each farmers knows where to plant the trees. The associated trees are randomized on the field.

- control of the holing for rubber (6 x 3 m according to contour) and associated trees (9 x 12 m according to contour). All holes for rubber have to be completed by farmers at the end of September. All holes for associated trees should be completed for October.

- checking of stumps in polybags in farmers locations : with a good irrigation and control of growth (control that the shout is coming from the grafted bud and not from the rootstock) and ensure that there is enough stumps for planting, or replacements of dead trees; in case there is not enough stumps in polybag (related to the number of dead trees per fields) : immediately report to Pak Hisar for ordering more stumps from Sembawa.

- checking of the associated trees nurseries in farmers locations.
Each farmers should prepare :
- 20 durians
- 20 petai
- 20 jengkol
- 20 kemiri
- 50 cinnamon.
- implementation of a stock security nursery for associated trees in Rao in PPL's place.
With the following :
- 200 durians
- 200 petai
- 200 jengkol
- 200 kemiri
- 200 cinnamon.

- rubber growth monitoring for 2 farmers fields : Pak Siam and pak Burham, according to the protocol (measurements of 30 trees per plot with diameter, number of payung and height). So the number of trees to be measured , according to the fields maps is the following :

  - RAS 2.2a/rubber fertilization : 3 plots with fertilization dose x 30 trees = 90 trees per field
  - RAS 2.2b /Rice fertilization : 4 plots x 30 trees = 120 trees per field
  - RAS 2.2c/ Comparison clone/BLIG : 3 plots x 30 trees = 90 trees per trees.

Data are collected on the "rubber growth monitoring file" available in the RAS plot files with 1 page per plot.

.- distribution of fertilizers and rice seeds to the farmers : fertilizers for rubber (planting time) and for rice (planting time and later for urea), according to tables available in the Augustus Field Report.

- making of the signs and implementation in the fields : Big sign of trials presentation at the entrance of the fields, signs per farmers close to each fields and signs per plots.

OCTOBER

- planting of rubber and fertilization at planting time :
  - specific fertilization for RAS 2.2a (Ema and Warni)
  - same fertilization for all the others : 200 grams of RP per tree at planting time

- planting of improved rice and fertilization at planting time (1/3 dose urea + SP 36 and KCL : see the protocol for the dose /ha and the tables in the report for each dose calculated per plot for each farmer.

- planting of associated trees : between October and December according to the tree status in polybags.

NOVEMBER

- distribution of UREA for rice experiment and monitoring of urea broadcast in the field (1 month after planting : 1/3 dose urea).

- monitor the planting of associated trees
- checking of the rice : chemical treatment if necessary in case of attacks of insects and pests.

DECEMBER

- distribution of UREA for rice experiment and monitoring of urea broadcast in the field (2 month after planting : 1/3 dose urea)

- monitor the planting of associated trees

- monitoring of rice harvesting (local rice) and control of rice production per plot (measuring the weight : production of the plot) and sending a sample of 100 grams of rice to ICRAF/Bogor.

- RAS 2.2a/rubber fertilization : 3 plots with fertilization dose : so measurement of rice production for each.

- RAS 2.2b /Rice fertilization : 4 plots : so measurement of rice production for each.

- RAS 2.2c/ Comparison clone/BLIG : 3 plots : so measurement of rice production for each.

- monitoring of dead plants in the fields (same as in September for all 8 fields.
- checking of the rice : chemical treatment if necessary.

Monitoring of labour

Each farmers should have a copy of the "buku buruh" and report in thisbook everytime he's going to SRAP plot the following :
- activity
- number of persons
- number of hours
- type of buruh : keluarga (familial) or Lain (external)
- the plot concernec (bagian).

The PPL should once a month that information is well collected by farmers. It is important for the farmers to be concerned wxith data collecting.

A monthly report of activities and problems will be sent every month to Pro-RLK and to BPS.
A technical mission with BPS (Pak Hisar), PRO-RLK/GTZ (Hellen Kramer) and ICRAF (E Penot) is scheduled in December. A further programme of activities will be then drafted.

INPUTS AND ACTIVITIES DISTRIBUTION BETWEEN FARMERS AND SRAP

SRAP project : INPUTS AND ACTIVITIES	FARMER : INPUTS AND ACTIVITIES
Rubber stumps for : Planting : Pak muktar and pak Badul replacements : all other farmers	Planting and replacement
fertilizers for rubber	application according to TRIAL protocoles
wayararem AND Jatiluhur seeds (improved upland rice)	local rice seeds
fertilizers for rice	seeds of palawijas for dry season cropping
Insecticides ad pesticides for rice A special sprayer is supplied for that particular activity	Chemical treaments in the fields
Flemingia for contour line	Implementation of contour line
Buku Buruh + bolpen	Record of activities in the ICRAF fields
tools (cangkol)	
Protection system against wild pigs (4 per farmers)	Control of animals
Round-up for new farmers for plot preparation for planting BLIG	Spraying in the fields
BLIG and seedlings from SUMSEL planting material	Plot preparation and planting
polybag for rubber and associated trees	Nurseries for rubber and associated trees
Plants of Sao for associated trees	collecting 20 seeds of Durian, 20 seeds of jengkol, 20 seeds of kemiri, 20 seeds of petai and 50 cinnamon for associated trees

PROGRAMME OF TECHNICAL SUPPORT MISSIONS FROM BPS

Technical support mission from PBS (pak Hisar) are scheduled for Mid September, mid October and December.

The main activities will be the folowing :

MID- SEPTEMBER

- Control of the activities to be implemented according to the programme of activities
- preparation of the rice experimentation

- control of the plot stacking for rubber, for the associated trees and for the plot division of each field.

- ***collection of soils samples by plot and by trials***.
Two samples are collected per location : one for the 0-15 cm and one for the 15-30 cm. A sample is made with a minimum of 10 samples per plot and mixed together.

The soils samples to be collected is the following :

TRIALS	number of plots per trial	number of trials	total number of soils samples per location to be collected
RAS 2.2 a	**6**	**2**	**12**
RAS 2.2 b	**4**	**4**	**8 (pak Badul + pak Muktar) + 2 (others) = 10**
RAS 2.2 c	**3**	**2**	**6**
TOTAL			**28 locations**

Note : Only the 4 plots of pak Badul and Pak Muktar are sampled. The other RAS 2.2 b are all planted with the same local rice : in 1996 : there is no 4 plots in term of rice experiment. So for the 2 other farmers (Pak Siam and pak Burham) : only 1 sample per field.

TOTAL SOIL SAMPLES : 28 locations x 2 samples per location (0-15 and 15-30) : 56 soil samples.

All soil samples should be processed in Septembe and a report, with soil sample analysis and comments should be sent to E Penot in october 1996.

MID- OCTOBER

- Control of the activities to be implemented according to the programme of activities
- control of the rice experimentation
- control of the rubber planting
- control of the associated trees planting
- control of rubber fertilization according to the protocol
- control of rice fertilization according to the protocol
- control of the signs in the plots according to field maps
- information to farmers about the different treatments in the plots

DECEMBER

This mission will be a joint mission with PBS (pak Hisar), ICRAF (E Penot) and Pro-RLK (H Kramer and Pak Sofyan).

OTHER MONITORING ACTIVITIES to be implemented by Pak Sofyan

Paddy species survey :

Pak Sofyan may supervise a short survey on the local upland rice varieties used by the farmers/ It will help us to select the best local variety, ie the best adapted to local conditions and appreciated by farmers, to be used in our trials. Survey file is in anex 3.

RAS Plot files

Each field should have its plo-file with all relevant information (data, groth monitoring, maps.....). Plot-files are available in the first SRAP report of march 1996 and have been translated.

Monitoring of labour

Each farmers should have a copy of the "buku buruh" and report in thisbook everytime he's going to SRAP plot the following :
The PPL should once a month that information is well collected by farmers. ***Pak Sofyan should sheck that labour monitoring is correctly done.***

Technical training

Pak Hisar should train technically on rubber, rice and soil conservation the PPL and all staff from Pro-RLK/Disbun involved in our on farmexperimentation in the fields.

Order of inputs.

See in anex 2 the inputs requirements and the date of supply.

SRAP
Smallholder Rubber Agroforestry Project
ICRAF/GAPKINDO/SRAP

WEST-SUMATRA

PROGRAMME OF ACTIVITIES FOR DECEMBER 1996 TO FEBRUARY 1997

NUMBER 3/december 1996

R.A.S ON FARM EXPERIMENTATION
IMPLEMENTATION IN THE WEST-SUMATRA PROVINCE
In East Pasaman

Eric Penot, ICRAF
Pak Hisar, BPS
20 December 1996

PROGRAMME OF ACTIVITIES FOR Pak Coan PPL/DISBUN

Time table : 1 or 2 days per week.

Programme of activities per month

DECEMBER

- **1 - to provide Ema and Warni's field with the fertilizer** according to the RAS 2.2a protocol :

Plot A : no fertilizers.

Plot B : 1 kg of RP/tree : 1 meter around the tree with cangkol 20 cm deep
.Later in february we will apply 500 kg/ha of RP : wait for Eric's fax to know which quantity will be applied.
RP = rock phosphate

Plot C : 200 RP grams per tree, 1 meter around the tree with cangkol 10 cm deep <

- **2 - to provide all trees planted in october/december (replacement of dead trees) with fertilizer 200 grams RP per tree**, 1 meter around the tree with cangkol 10 cm deep

- **3 - planting of associated trees** in each field : spacing : 9 x 12 meters with the following spacies :
- . Durian
- rambutan : 10 per field
- cassiavera (in replacement of kemiri)
- petai
- jengkol

Plants in nursery in Rao should be transported as soon as possible to Bangkok and distributed to farmers.

- 4 - maps of each RAS fields:
Revision and actualization of the maps of each fields will be made by the PPL and sent to Eric Penot/ICRAF, Pak Hisar/Sembawa, copy to Pak Ruesli/DISBUN and to ellen Kraner/ProRLK. Fields maps have the complete design of the fields with the following :

- all rubber trees, tree per tree, per plot
- all associated trees : planted by tghe project + the trees planted by the farmers (pinang etc...) + the trees that grows naturally..

- all crops during the rainy season : paddy local, paddy unggul, peanut, sayur, other....

PPL and other staff should use these fields maps in order to implement the fields and monitor the farmers activities on rice and rubber planting, planting of associated trees and rice and rubber fertilization.

- **5 - measurements of all cropped area** : per crop : in the area of the trial.

- **6 - implementation by farmers of the small tree individual terraces** (terase bangku)

- **7 - check the paddy fields and apply Dharmabas** (obat) if necessary to protect rice against insects.

Sent the monthly report to Eric, Ellen, Rusli and Hisar.

JANUARY

- **1 - continuation of the checking of the paddy fields** and apply Dharmabas (obat) if necessary to protect rice against insects

- **2 - monitoring of the dead plants in each field** : each dead tree should be marked as "dead". For all fields. A table may report the total number of trees, the dead trees and the trees alive such as following :

Name of the farmer :
Type of trial:
Plot name :

PLOTS	total number of trees	DEAD TREES	TREES ALIVE
A			
B			
etc.....			

Replanting of dead trees as soon as possible.

- **3 - Distribution of fertilizer for crops in the dry season** (paddy and peanut).

- **4 - buy the seeds of** Jatiluhur for Siam and Ema (40 kg per farmer), and peanut seeds for Pak badul

- **5 - monitoring of paddy production and other crop production :** production per plot : area per plot for each crop -paddy, peanut others...) : collect a sample of 150 grams foe each pady plot with information (variety, name of the farmer, fertilization, date of planting and date of harversting) to pak Hisar for measuring % of water in paddy.

- **6 - check the growth of Flemigia in all plots** : if it does not grow ; replanting of Flemigia.

Sent the monthly report to Eric, Ellen, Rusli and Hisar.

FEBRUARY

- **1 - check the planting of "dry season" crops in the field.**
making of the signs in the fields for each "dry season" crop.

- **2 - programme pemupukan "setiap 3 bulan" untuk karet :**

Ema dan Warni : plot C saja
all RAS 2.2B : Badul, Muktar, Siam dan Burham
all RAS 2.2 c : Udin and Budiman

Sent the monthly report to Eric, Ellen, Rusli and Hisar.

Monitoring of labour

Each farmers should have a copy of the "buku buruh" and report in this book everytime he's going to SRAP plot the following :
- activity
- number of persons
- number of hours
- type of buruh : keluarga (familial) or Lain (external)
- the plot concerned (bagian).

The PPL should check once a month that information is well collected by farmers. It is important for the farmers to be concerned with data collecting.

A monthly report of activities and problems will be sent every month to Pro-RLK and to BPS.

ANEX 1

November Progress Report
Pak Hisar Sihombing
BPS/IRRI

SRAP West-Sumatra Progress Report n° 3/1996

RESEARCH ON RUBBER AGROFORESTRY SYSTEMS IN EAST PASAMAN AREA WEST SUMATRA PROVINCE

Progress report in November 1966

Hisar Sihombing

Indonesian Rubber Research Institute
Sembawa Reseacrh Station

Content :

A. Description of plant and weeds in each plot

1. Most of farmer has planted some annual crops and associated trees in their field.
2. The weeds in all plots generally clean to moderate condition

1. Farmer : Budiman

RAS 2.2.c : Comparation of PB 260 clone vs seedling

Treatment	Annual crops	Associated trees	Weeds
Plot A: BLIG	peanuts, k. hijau (Ind), papaya, rice, cassava, banana	pinang (Ind), casiavera coffee,	clean
Plot B: PB 260	rice	jengkol (Ind), kemiri (Ind)	moderate
Plot C: Sumsel seed's	rice, papaya	jengkol (Ind)	moderate

2. Farmer : Udin

RAS 2.2.c : Comparation of RRIC 100 clone vs seedling

Treatment	Annual crops	Associated trees	Weeds
Plot A: BLIG	cassava	casiavera,	moderate
Plot B: RRIC 100	rice, cassava, banana, sugarcane, peanuts	casiavera	moderate
Plot C: Sumsel seed's	rice, hot,	casiavera	clean

3. Farmer : Warni

RAS 2.2.a : Fertilization on PB 260 rubber clone

Treatment	Annual crops	Associated trees	Weeds
Plot A: No fertilizer	banana,	coffee, pinang (Ind) durian, jengkol (Ind) casiavera	clean
Plot B: R.phosphate	rice banana, hot,sugarcane	coffee, pinang (Ind)	clean
Plot C: Compelete fertilizer	cassava, hot papaya, banana, sugarcane	pinang (Ind), coffee,	clean
Plot D: No fertilizer	sugarcane, papaya, hot, banana, cassava, ubi jalar (Ind)	coffee, pinang (Ind)	clean
Plot E: R.phosphate	banana, papaya, cassava	coffee, pinang (Ind), jengkol (Ind)	moderate
Plot F: Compelete fertilizer	cassava	pinang (Ind), old rubber jengkol (Ind)	moderate

4. Farmer : Ema

RAS 2.2.a : Fertilizztion on RRIC 100 rubber clone

Treatment	Annual crops	Associated trees	Weeds
Plot A: No fertilizer		pinang (Ind), jengkol (Ind),	clean
Plot B: R. phosphate		casiavera, jengkol (Ind)	clean
Plot C: Compelete fertilizer		casiavera, jengkol(Ind)	moderate
Plot D: No fertilizer		casiavera, jengkol (Ind)	moderate
Plot E: R. phosphate		jengkol (Ind)	moderate
Plot F: Compelete fertilizer		jengkol (Ind)	moderate

5. Farmer : Siam

RAS 2.2.b : Fertilization on rice as an intercropping of rubber trees

Treatment	Annual crops	Associated trees	Weeds
Plot A: Wayrarem/Jatiluhur No fertilizer	banana, sugarcane,cassava	casiavera, jengkol (Ind)	clean
Plot B: Wayrarem/Jatiluhur Compelete fertilizer	sugarcane, papaya, banana	casiavera,durian	moderate
Plot C: Local rice var. No fertilizer	sugarcane, papaya, cassava, banana	casiavera,durian	moderate
Plot D: P.lokal Compelete fertilizer	papaya, banana banana	casiavera, durian	moderate

Note : No fertilizer treatment on rice in 1996

6. Farmer : Burhan

RAS 2.2.b : Fertilization on rice as an intercropping of rubber trees

Treatment	Annual crops	Associated trees	Weeds
Plot A: Wayrarem/Jatiluhur No fertilizer	cassava, banana, sugarcane	petai, durian, casiavera, pinang (Ind)	clean
Plot B: Wayrarem/Jatiluhur Compelete fertilizer	banana, papaya, cassava, sugarcane	casiavera,kemiri (Ind)	clean
Plot C: Local rice var. No fertilizer	banana, serai (Ind), cassava sugarcane, papaya	casiavera, kemiri (Ind) durian, petai	clean
Plot D: Local rice var. Compelete fertilizer	banana, peanuts, jagung, papaya	kemiri (Ind), jengkol (Ind)	clean

Note : No fertilizer treatment on rice in 1996

7. Farmer : Muktar

RAS 2.2.b : Fertilization on rice as an intercropping of rubber trees

Treatment	Annual crops	Associated trees	Weeds
Plot A: Local rice var. No fertilizer	cassava, rice		clean
Plot B: Local rice var. Compelete fertilizer	cassava, rice	pinang (Ind)	clean
Plot C: Wayrarem/Jatiluhur Compelete fertilizer	cassava, banana	pinang (Ind),	clean
Plot D: Wayrarem/Jatiluhur Compelete fertilizer	cassava	pinang (Ind)	clean

Note : No fertilizer treatment on rice in 1996

8. Farmer : Badul

RAS 2.2.b : Fertilization on rice as an intercropping of rubber trees

Treatment	Annual crops	Associated trees	Weeds
Plot A: Way rarem Compelete fertilizer	hot, rice		clean
Plot B: Way rarem No fertilizer	hot, rice		moderate
Plot C: Jati luhur No fertilizer	hot, rice		moderate
Plot D: Jatiluhur Compelete fertilizer	hot, rice		moderate 40% imperata 60%

B Rubber trees performance (height, girth, and leaf whorl) in two sites RAS 2.2.b experiment (Burhan and Siam)

1. Rubber was planted in July to August 1996
2. Each plot consist of 30 trees for observation, where the average below comes from
3. Next obervation will be doing in January 1997

Farmer : Burhan
RAS : 2.2.b
Topic : Fertilization on rice as an intercropping of rubber trees
Oberservation : 1
Date : 12 September 1996

Replication	Girth (cm)	Height (cm)	Whorl
Plot A	3.10	73.77	2.07
Plot B	3.08	65.47	2.23
Plot C	3.45	88.20	2.80
Plot D	3.15	69.53	2.47
Average	3.20	74.24	2.39

Farmer : Siam
RAS : 2.2.b
Topic : Fertilization on rice as an intercropping of rubber trees
Oberservation : 1
Date : 12 September 1996

Replication	Girth (cm)	Height (cm)	Whorl
Plot A	4.52	114.20	3.63
Plot B	3.15	88.30	2.73
Plot C	3.44	90.60	2.93
Plot D	3.62	99.83	3.17
Average	3.69	98.23	3.12

ANEX 2

INPUTS REQUIREMENTS
per farmer
per plot

actualised : 5/3/96

WEST SUMATRA SRAP ON FARM EXPERIMENTATION PROGRAMME

Village of Bangkok

FARMER	type of RAS	RAS name	CLONE	Date of planting	ACTUAL TOTAL AREA real	Number of rubber trees	Number of rep /farm	Number Of plots	TREAMENTS
						550			fertilization dose
EMA	RAS 2.2a	Rubber fertilization	RRIC 100	Jan 96	1.26	692	2	6	0, RP planting only, TCSDP
				oct 96					
WARNI	RAS 2.2a	Rubber fertilization	PB 260	Jan 96	1.27	700	2	6	0, RP planting only, TCSDP
				oct 96					
SIAM	RAS 2.2b	Rice experimentation	PB 260	Jan 96	0.92	506	1	4	2 varietiesxdose(0, CRIFC)
				oct 96					cancelled in 96
BURHAN	RAS 2.2b	Rice experimentation	PB 260	Jan 96	0.98	538	1	4	2 varietiesxdose(0, CRIFC)
				oct 96					cancelled in 96
UDIN	RAS 2.2c	Clone/BLIG comparison	RRIC 100	Jan 96	0.51	281	1	3	clonexBLIGxseedlings
			BLIG 1	March 96	0.21	116	1		
			seed/sumsel	oct 96	0.17	94	1		
				TOTAL	0.89	491			
BUDIMAN	RAS 2.2c	Clone/BLIG comparison	PB 260	Jan 96	0.52	285	1	3	clonexBLIGxseedlings
			BLIG 1	March 96	0.19	103	1		
			seed/sumsel	oct 96	0.20	108	1		
				total	0.90	496			
BADUL	RAS 2.2b	Rice experimentation	PB 260	oct 96	0.90	496	1	4	2 varietiesxdose(0, CRIFC)
MUKTAR	RAS 2.2b	Rice experimentation	RRIC 100	oct 96	0.88	483	1	4	2 varietiesxdose(0, CRIFC)

FERTILIZERS REQUIREMENT FOR 1996

March 97

FARMER	PLOT	Nb of rubber trees	RUBBER REQUIREMENT FOR 1996/97 PLANTING RP 200 grams/tree	SETIAP TIGA BULAN LATER SP36 40	UREA 50	KCL 40
				to be supplied in dec for January 97		
	PLOT		in kg/field			
EMA	A1	41	0	0	0	0
	A2	36	0	0	0	0
	B1	40	8	0	2.0	0
	B2	37	7	0	1.9	0
	C1	38	19	1.5	1.9	1.5
	C2	37	19	1.5	1.9	1.5
	DILUAR	463	93			
WARNI	A1	48	0	0	0	0
	A2	39	0	0	0	0
	B1	46	9	0	2.3	0
	B2	36	7	0	1.8	0
	C1	43	22	1.7	2.2	1.7
	C2	35	18	1.4	1.8	1.4
	DILUAR	453	91			
SIAM		506	101	20.2	25.3	20.2
BURHAN		538	108	21.5	26.9	21.5
UDIN		491	98	19.6	24.6	19.6
BUDIMAN		496	99	19.8	24.8	19.8
BADUL		496	99	19.8	24.8	19.8
MUKTAR		483	97	19.3	24.2	19.3
			RP	SP36	UREA	KCL
TOTAL		4,402	894	127	166	127

to be supplied in March, June, September, December 1997

	TOTAL REQUIREMENT FOR RUBBER			
	RP	SP36	UREA	KCL
Total kg	894	127	166	127
	Dec 96	to be supplied in january 1997		

	TOTAL REQUIREMENT FOR RICE			
	RP	SP36	UREA	KCL
Total kg		686	844	449
	to be supplied in january 97			

TOTAL REQUIREMENT FOR RICE and RUBBER				
	RP	SP36	UREA	KCL
Total kg	**894**	**813**	**1,010**	**575**